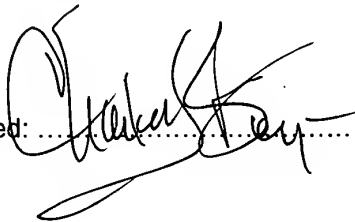

EXHIBIT CB1

This is the Exhibit marked CB1 referred to in the Declaration of CHUCK BOYCE

Signed:

A handwritten signature in black ink, appearing to read "Chuck Boyce", is written over the dotted line of the signature field.

PATENT
DOCKET NO.: 1182-¹²~~2~~ (a)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT : LODGE ET AL.
SERIAL NO. : 10/078,024
FILED : FEBRUARY 15, 2002
TITLE : DECORATION METHOD USING THERMOCHROMIC INK
EXAMINER : CROCKFORD
GROUP ART UNIT : 1762

DECLARATION UNDER C.F.R. 1.132

Honorable Commissioner for Patents
and Trademarks
Washington, D.C. 20231

I, CHARLES J (aka Chuck) BOYCE, a US citizen c/o of Matsui International Company, Inc. of
1501 West 178th Street, Gardena, California 90248, USA, declare:-

1. I am the Managing Director and a Vice President of Matsui International Company, Inc. of 1501 West 178th Street Gardena California 90248, USA, a position I have held since February 1988. I make this Declaration from my own personal knowledge and from the records of my company to which I have full access. Matsui International Company is a subsidiary of Matsui Shikiso Chemical Company Ltd of Japan. We offer a wide range of pigments, ink and ink products for a broad range of applications including the textile, wallpaper, printing, transfer and speciality markets. Part of our product portfolio includes a range of "thermochromic" or color change paints, inks and plastics. By increasing or decreasing the temperature the colour in these pigments changes from one color to another or becomes colorless. This state-of-the-art technology finds particular use in the novelty and promotional item market. Matsui is one of the world leaders, if not the world leader, in color change technology.

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2. Matsui International Company Inc supplies products throughout the world, other than to the Japanese market, which is serviced by our parent company. We work closely with our customers to customize our products to their needs. As a result I see from time to time numerous new ways to incorporate color change technology into a wide range of products. Our own scientists are also working to find new ways to extend our market share.
3. One of our customers in the United Kingdom is The Promotion Consultancy Ltd and our contact there is James Lodge. Whilst I therefore know James Lodge and I am familiar with his WOWMUGS product, I am giving this evidence independently. Early in 1997 James Lodge contacted me directly to discuss in confidence a new product concept he had developed for a promotional item. His process involved over-coating most or all of the outer surface of a glazed ceramic item, such as a teapot or a mug, with a color change pigment. The color would change to colorless when hot liquid was poured into the item. I was unable to help James Lodge on this occasion in that I did not believe this effect could be achieved on a marketable product. We sell an epoxy-based thermochrome paint which can be screen-printed or spray painted onto a glazed ceramic item but this would not produce the effect that James Lodge was seeking to achieve. Screen-printing is only suitable for relatively small areas. Certainly, at that time, I was not aware of any process by which the whole outer surface of a teapot, including the spout and handle, or a mug could be screed printed cheaply and evenly. Spray painting is laborious and expensive and the end result would likely not have a "professional" finish.
4. I sent to James Lodge in the Spring of 1997 an example of the very best color change mug that I was aware of. This was a mug produced by Matsui International to commemorate 10 years of excellence. The mug had a logo screen printed on the side

in two positions. When filled with hot liquid the logo changed color and a region became colorless to reveal a message about our 10 years of achievement. The combined areas of these two logos covered perhaps 15 – 20% of the outer surface of the mug. This was not the effect James Lodge was trying to create but was the best we could achieve at that time.

5. I understand that James Lodge went on to perfect the process he had devised and that products made according to this process are now sold under the WOWMUGS trade mark. These products are illustrated in a WOWMUGS publicity handout now shown to me as Exhibit CB1.
6. I have been given a copy of US Application Serial No. 10/078,024 , attached as Exhibit CB2, which I understand is currently under examination. I also understand that there have, in the past, been objections from the USPTO that the invention is obvious.
7. With regards to obviousness, if it were obvious, then our people would have tried it because it is their job to make such inventions. There was back in June 1998 nothing that I am aware of to direct or encourage anyone to formulate one of our inks, particularly a water-based ink, into a coating that could be electrostatically sprayed onto, and successfully adhere to, a glazed ceramic. Nor was there any reason to believe that one could overspray this first coat and achieve a dishwasher proof end product. I would have expected the resultant finish to rub or peel off relatively easily. I know from my own experience that the industry did not believe that this could be achieved so as to produce a marketable product. To summarise, I was not aware at that time of any spray painting process which would have been applicable to thermochromic inks or paints and which could be used successfully to coat the whole outer surface of a ceramic mug.

8. I have seen copies of the prior art filed cited by the US examiner now shown to me as Exhibit CB3. None of this prior art changes the view I formulated at the time James Lodge first approached me, namely that the process could not be done in a workable manner. In my opinion none of the prior art anticipates this invention, nor teaches the skilled reader enough so as to render the invention obvious.

The undersigned, declares further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date:

Jan 8, 20032002

Signed:

Yanki Bey

EXHIBIT CB2

This is the Exhibit marked CB2 referred to in the Declaration of CHUCK BOYCE

Signed: 

DECORATION METHOD

This invention concerns a decoration method and particularly but not exclusively a decoration method usable on products such as items of tableware.

Presently a wide range of decoration methods and techniques are applied to items such as tableware, e.g. cups, plates, teapots etc. It is desirable to produce new affects in such decoration. It is also generally a requirement that such decorations should be durable and also dishwasher proof.

Thermochromic inks are materials which at a specified temperature change colour, or become transparent or at least translucent.

According to the present invention there is provided a method of decorating an article, the method comprising mixing a thermochromic ink with a first coating material, applying the mixture onto part or all of a surface of the article, once the mixture is set applying a second coating material onto said surface of the article.

The second coating material is preferably transparent. The second coating material is desirably substantially dishwasher proof.

The first coating material is preferably transparent.

The first and/or second coating materials preferably comprise lacquers. The first coating material preferably comprises an organic water based lacquer, though the lacquer could be acrylic based. The second coating material preferably comprises a two-part epoxy fortified acrylic resin, including an activator and a thinner.

The proportion of ink in the mixture is preferably within the range 5-25%.

The mixture and/or second coating material are preferably cured following application onto the article. The curing preferably commences with a period in an infra red shortwave drier followed by a heat cure. The heat cure preferably comprises a lower temperature first period, followed by a higher temperature second period. For the mixture, the first period preferably lasts between one and two minutes at 35°C to 65°C, with the second period lasting eight to twelve minutes at 140 to 220°C. For the second coating the first period preferably lasts between eight and twelve minutes at 35 to 65°C, with the second period lasting twenty five to thirty minutes at 110 to 165°C.

A decoration may be provided on the article beneath the mixture such that when the thermochromic ink is at least translucent, said decoration is visible.

The mixture may comprise a plurality of thermochromic inks with different colour change temperatures, and the inks may be of different colours.

The mixture and/or second coating material may be applied to the article by spraying, and desirable electrostatic spraying. In the latter case, an electrostatic thinner may be added to the mixture and/or second coating prior to spraying.

The mixture and/or the second coating material are preferably sprayed to a thickness of between 12 and 24 microns.

An embodiment of the present invention will now be described by way of example only.

A ceramic teapot is formed, decorated and glazed in a conventional manner so as to have a pattern such as a series of fruit on it. A thermochromic outer layer is then applied as follows. A dark blue thermochromic ink is mixed with an organic water-based lacquer with 5 to 25% of the ink, dependent on the strength of colour required. An electrostatic thinner is added to the mixture

which is then applied by electrostatic spraying using an RD-3000 Turbodisc system. The mixture is sprayed to provide a 20 micron layer.

This layer is then cured by an initial pass through an infra red shortwave drier and then a subsequent pass through a gas convection drier or driers with an initial first stage of one to two minutes at 35 to 65°C, and a second stage lasting eight to twelve minutes at 140 to 220°C.

A transparent outer coating is then applied to the teapot as follows. A two-part epoxy fortified acrylic resin is mixed together and applied by electrostatic spraying in a similar manner to the first layer outlined above. This second layer is then cured again with a first pass through a shortwave infra red drier and then subsequent passes through a gas convection drier initially for eight to twelve minutes at 35 to 65°C, and then twenty five to thirty minutes at 110 to 165°C.

The finished product has a durable glossy finish which is substantially dishwasher proof. At room temperature the teapot is dark blue. When boiling water is added the thermochromic ink changes to a substantially transparent state such that the fruit pattern beneath the thermochromic coating can be clearly seen. As the teapot subsequently cools, the dark blue colouring will return to again obscure the fruit pattern.

There is thus described a decoration method which permits items such as ceramic tableware to be readily decorated in a relatively straightforward manner with a novel decoration. In view of the good finish provided by the decoration and the fact that it is substantially dishwasher proof, the decoration does not detract from the product and provides considerable enhancement with the decoration.

It is to be realised that a wide range of decorations can be provided using a method according to the present invention, to provide for example decorations which appear or disappear at below or above room temperature.

These decorations can selectively obscure decorations, messages etc. therebeneath. It is possible for a plurality of different inks with different colour change temperatures and perhaps also different colours to be mixed, such that a decoration can pass from one colour perhaps to reveal a pattern or decoration therebeneath, and subsequently to move to a further colour as the temperature rises or falls. A wide range of colours can be used as is available.

Various other modifications may be made without departing from the scope of the invention. For example, the coatings could be applied by different techniques and perhaps only to cover part of the surface of an article to provide particular effects. Different spraying and/or curing conditions can be used etc., as are appropriate to particular materials used. The technique whilst ideally suited to decorating tableware, can be used on a wide range of articles.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. A method of decorating an article, the method comprising mixing a thermochromic ink with a first coating material, applying the mixture onto part or all of a surface of the article, once the mixture is set applying a second coating material onto said surface of the article.
2. A method according to claim 1 wherein the second coating material is transparent.
3. A method according to claim 1 or 2 wherein the second coating material is substantially dishwasher proof.
4. A method according to any of claims 1 to 3 wherein the first coating material is transparent.
5. A method according to any of claims 1 to 4 wherein the first and/or second coating materials comprise lacquers.
6. A method according to claim 5 wherein the first coating material comprises an organic water based lacquer.
7. A method according to claims 5 or 6 wherein the first coating material comprises an acrylic based lacquer.
8. A method according to claim 7 wherein the second coating material comprises a two-part epoxy fortified acrylic resin, including an activator and a thinner.
9. A method according to any of the preceding claims wherein the proportion of ink in the mixture is within the range 5-25%.
10. A method according to any of the preceding claims wherein the mixture

and/or second coating material are cured following application onto the article.

11. A method according to claim 10 wherein the curing commences with a period in an infra red shortwave drier followed by a heat cure.

12. A method according to claims 10 or 11 wherein the curing includes a heat cure comprising a lower temperature first period, followed by a higher temperature second period.

13. A method according to claim 12 wherein for the mixture, the first period lasts between one and two minutes at 35°C to 65°C, with the second period lasting eight to twelve minutes at 140 to 220°C.

14. A method according to claims 12 or 13 wherein for the second coating the first period lasts between eight and twelve minutes at 35 to 65°C, with the second period lasting twenty five to thirty minutes at 110 to 165°C.

15. A method according to any of the preceding claims wherein a decoration is provided on the article beneath the mixture such that when the thermochromic ink is at least translucent, said decoration is visible.

16. A method according to any of the preceding claims wherein the mixture comprises a plurality of thermochromic inks with different colour change temperatures.

17. A method according to claim 16 wherein the inks are of different colours.

18. A method according to any of the preceding claims wherein the mixture and/or second coating material are applied to the article by spraying.

19. A method according to claim 18 wherein the mixture and/or second coating material are applied to the article by electrostatic spraying.

20. A method according to claim 19 wherein an electrostatic thinner is added to the mixture and/or second coating prior to spraying.
21. A method according to any of claims 18 to 20 wherein the mixture and/or the second coating material are sprayed to a thickness of between 12 and 24 microns.
22. A method of decorating an article, the method being substantially as hereinbefore described.
23. Any novel subject matter or combination including novel subject matter disclosed, whether or not within the scope of or relating to the same invention as any of the preceding claims.

ABSTRACT

A method of decorating an article, the method comprising mixing a thermochromic ink with a transparent lacquer, applying the mixture on to part or all of the surface of an article, once the mixture is set, applying a second layer of dishwasher proof transparent lacquer.

EXHIBIT CB3

This is the Exhibit marked CB3 referred to in the Declaration of CHUCK BOYCE

Signed:

A handwritten signature in black ink, appearing to read "Chuck Boyce", is written over the dotted line of the "Signed:" field.